MICRO WELD

J5-8 BUTT WELDERS

MICRO PRODUCTS COMPANY

SERVICE MANUAL

J5-8 BUTT WELDERS SERVICE MANUAL
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1.0 SPECIFICATIONS

	MODELS FOR STEEL WIRE		
	MODEL J5S	**MODEL J6S**	**MODEL J8S**
Stock Size Range	.060”-.250” 1.5mm-6.35mm	.187”-.375” 4.75mm-953mm	.250”-.500” 6.35mm-12.7mm
Material Suitability	Steel rod	Steel rod	Steel rod E.C. Aluminum
Operating Voltages	230/460 60 hertz	230/460 60 hertz	230/460 60 hertz
Line Demand 460 volt	22amps@100% duty 70amps@10% duty	22amps@100% duty 70amps@10% duty	37amps@100% duty cycle 117amps@10% duty cycle
Line Demand 230 volt	44amps@100% duty 139amps@10% duty	44amps@100% duty 139amps@10% duty	74amps@100% duty cycle 234amps@10% duty cycle
Transformer Rating Single Phase AC*	14.0 KVA	14.0 KVA	24.0 KVA
Heat Selection Switch	6 point	6 point	12 point
Dimensions and Weights – Truck Type			
Overall Height	44” 112cm	44” 112cm	44” 112cm
Weld Die Height	41 ½” 105cm	41 ½” 105cm	41 ½” 105cm
Floor Space	31” x 28 ½” 79cm x 72cm	31” x 28 ½” 79cm x 72cm	31” x 28 ½” 79cm x 72cm

	MODELS FOR COPPER AND E.C. ALUMINUM WIRE		
	MODEL J5C	**MODEL J7C**	**MODEL J8C**
Stock Size Range	.080”-.250” 2mm-6.35mm	.187”-.375” 4.75mm-953mm	.187”-.500” 4.75mm-12.7mm
Material Suitability	Copper and E.C. Aluminum	Copper and E.C. Aluminum	Copper and E.C. Aluminum
Operating Voltages	230/460 60 hertz	230/460 60 hertz	230/460 60 hertz
Line Demand 460 volt	37amps@100% duty 117amps@10% duty	56amps@100% duty 320amps@10% duty	56amps@100% duty cycle 320amps@10% duty cycle
Line Demand 230 volt	74amps@100% duty 234amps@10% duty	111amps@100% duty 640amps@10% duty	111amps@100% duty cycle 640amps@10% duty cycle
Transformer Rating Single Phase AC*	24.0 KVA	36.0 KVA	36.0 KVA
Heat Selection Switch	12 point	12 point	12 point
Dimensions and Weights – Truck Type			
Overall Height	44” 112cm	44” 112cm	44” 112cm
Weld Die Height	41 ½” 105cm	41 ½” 105cm	41 ½” 105cm
Floor Space	31” x 28 ½” 79cm x 72cm	31” x 28 ½” 79cm x 72cm	31” x 28 ½” 79cm x 72cm

*50% rated duty cycle

	FLASH WELDER		NON-FERROUS FLAT STOCK WELDER	
	MODEL J5SF	**MODEL J6SF**	**MODEL J5ADU**	**MODEL J6ADU**
Stock Size Range	.005”-.050” (2)	.012”-.128” (2)	.005”-.050” (2)	.012”-.065” (2)
	Cross section	Cross section	Cross section	Cross section
Minimum Thickness	.010”	.020”	.015”	.020”
Maximum Width	1.0”	1.25”	1.0”	1.25”
Operating Voltages	230/460 60 hertz	230/460 60 hertz	230/460 60 hertz	230/460 60 hertz
Line Demand 460 Volts	37amps@100% duty 117amps@10% duty	37amps@100% duty 117amps@10% duty	37amps@100% duty 117amps@10% duty	37amps@100% duty 117amps@10% duty
Line Demand 230 Volts	74amps@100% duty 234amps@10% duty	74amps@100% duty 234amps@10% duty	74amps@100% duty 234amps@10% duty	74amps@100% duty 234amps@10% duty
Transformer Rating Single Phase AC*	24 KVA	24KVA	24 KVA	24 KVA
Heat Selection Switch	12 point	12 point	12 point	12 point
Dimensions and Weights – Truck Type				
Overall Height	44” 112cm	44” 112cm	44” 112cm	44” 112cm
Weld Die Height	41 ½” 105cm	41 ½” 105cm	41 ½” 105cm	41 ½” 105cm
Floor Space	31” x 28 ½”	31” x 28 ½”	31” x 28 ½”	31” x 28 ½”
	79cm x 72cm	79cm x 72cm	79cm x 72cm	79cm x 72cm

*50% rated duty cycle

2.0 GENERAL HOOK-UP INSTRUCTIONS

2.1 ELECTRICAL

First determine that the available electrical service in your plant corresponds to the nameplate rating located on the welder housing. Electrical wiring to the welder must be of sufficient size to deliver full ampere load with no appreciable loss during the weld cycle. The welder will not operate properly if there is more that a 5% variation in line voltages. In general, the welder should be fused with a slow blow fuse of the 100% duty cycle rating. The minimum power cable size to the welder can be obtained by using this same current rating. Refer to National Electric Code and local electrical regulations for adequate power cable sized and type, disconnect methods, and fusing guidelines.

Remember…line voltages to the welding machine are potentially dangerous should the power cords be damaged or severed. The welding voltages of the welding dies will not harm an operator, since they do not exceed 10 volts.

2.2 SAFETY PRECAUTIONS

2.2.1 ELECTRICAL

Maintain electrical cable to welder in good repair. Welder must be grounded and connections securely tightened. Heat switch must not be changed to new position while a weld cycle is in process. Disconnect electrical service before servicing welder – high voltages are located within the base of the welder.

2.2.2 MECHANICAL

Safety glasses must be worn by operator while using welder. Keep all safety guards on welders and use properly. Operators must be instructed on basic operation of unit to prevent injury. Check nameplate rating and keep within material size range for each welder.

2.3 WATER

It is important that if a welder is to be operated for an extended period of time, and headpieces heat up, water lines must be connected. On most model J series Micro-Weld welders, water-cooled headpieces are an option, which can be added at our factory. Connect hoses to inlet and outlet provided at the back of the weld head. A shut-off should be installed in the inlet line, and the hose from the outlet should run to an open-sight drain. Water should only flow during the weld cycle, and the temperature of the water at the drain should feel hot to the hand. This will prevent condensation on the welder headpieces, which could drip on the welding transformer and cause it to ground.

2.4 AIR

Air operated model J series Micro-Weld welders are an option. Should you have this option, air operation cylinders require a 90-psi air source. An air regulator will be provided to set the minimum amount of pressure needed for the material being welded.

3.0 GENERAL OPERATING INSTRUCTIONS
BASIC OPERATING PARTS

3.1 WELD HEAT SELECTION

This setting determines the amount of heat available for welding. Because of considerable variations in voltage and power factors in various plants, and wide variety in material composition, exact heat setting cannot be specified. In general, larger sizes of stock use higher heat setting.

Welding heat is selected by means of a heavy-duty switch, either 6 or 12 steps of voltage. The welder will be equipped with one type or the other depending upon the model. The switch is located conveniently on the right side of the welder. Number 1 indicates high heat; number 6 or 12 indicates low welding heat. Other numbers are equally graduated from high to low to allow just the right amount of voltage for the weld operation.

The heat switch should never be changed to a new setting during a welding operation.

3.2 SPACING MECHANISM

The welder is capable of welding a variety of material sizes, but each major change in material size requires a corresponding change to be made in the open space of the jaws. Spacing is obtained by rotating the space-adjusting knob located on the right side of the headpiece housing. The spacing knob determines the amount of weld upset and expelled metal projecting from the weld zone.

3.3 UPSET PRESSURE MECHANISM

Upset pressures are required for all weld operations. The model J series of Micro-Weld welders obtains its pressures from unique spring assemblies located on the clamp arms. The upset pressures are completely adjustable for various sizes and types of materials. Adjustment of the clamp spring pull determines the amount of upset pressure for the weld forging process. This is obtained by adjusting the length of the pull bar by one of two methods: (a) rotate the pullbar turnbuckle, or (b) changing the position of the capscrew on the lower part of the pullbar.

3.4 FLASH SPEED MECHANISM. For new speed mechanism see addendum.

On model J5SF and J6SF Welders, precise flashing speed regulation and final upset drop off is obtained from its unique hydraulic cylinder located on the right of the weld head. Flashing speed is set with the use of the flashing speed adjusting knob, which regulates the speed of the oil passing the internal valve. Number 1 indicates the slowest flashing speed. Turn the knob counterclockwise to increase the flashing speed. Generally, larger stock requires a slower flashing speed. Final upset is obtained when the piston is compressed to a point where the internal valve is bypassed allowing unrestricted movement. This bypass point can be adjusted by rotating the piston cap clockwise causing the unrestricted movement of the piston to begin when the welding dies are closer together. Properly made welds are perfectly sound and have little upset burr. Poor welds usually indicate too low heat or incorrect flashing speeds.

3.5 DOUBLE UPSET MECHANISM

On Models J5ADU and J6ADU Welders, the double upset mechanism performs a unique multifunction task. The addition of the spring loaded lever bar across the welder headpiece enables these welders to give a controlled "flash", then an initially low upset pressure followed by high pressure.

Mounted to this lever bar is a graduated leverage cog and just below mounted to the movable headpiece is a matching cog. The purpose of the opposing surfaces on the points of these cogs is to create friction, and restrict the movement of the movable platen to provide a type of controlled flashing action. This friction is increased or decreased by means of the small knob at the end of the lever arm. This knob changes the amount of compression on a spring in the tube below the lever arm.

Initial low upset pressure begins upon termination of weld current, while there is still some of the opposing surface of the bogs to overpower. Then the upper cog slides off the opposing surface of the lower cog, a wedging action transpires. The wedging action, coupled with the lever arm spring tension (which previously gave a frictional force), and the upset pressure created in the clamp arm spring, are all additively accumulated to achieve the final high-pressure upset tension. This not only increases the upset force, but also the upset speed, which is extremely critical in the weldability of certain aluminum alloys.

4.0 GENERAL OPERATING INSTRUCTIONS
BASIC OPERATING PARTS

4.0 SUGGESTED SETTINGS

MATERIAL	SIZE inches	HEAT	OPEN SPACE	GROOVE	PULLBAR TENSION	MODEL
Steel	.062	5	3	Front	1	J5S
	.162	4	5	Rear	1	
	.250	3	7	Rear	1	
Steel	.187	4	4	Front	1	J6S
	.250	4	6	Front	1	
	.375	3	9	Rear	1	
Steel	.250	10	6	Front	1	J8S
	.375	6	9	Rear	1	
	.500	4	9	Rear	1	
Copper	.062	11	4	Front	1	J5C
	.128	6	5	Front	1	
	.250	3	9	Rear	1	
Copper	.125	10	3	Front	4	J7C
	.250	7	6	Front	4	
	.375	3	9	Rear	1	
Copper	.250	7	6	Front	1	J8C
	.375	3	9	Front	1	
	.500	2	9	Rear	1	

4.1

MATERIAL	SIZE inches	HYD. CYL.	OPEN SPACE	HEAT	PULLBAR TENSION	MODEL
Steel	.015”x.500”	4	7	7	2	J5SF
	.031”x.750	5	7	5	2	
	.062”x1.000”	5	9	2	1	
Steel	.025”x.500”	5	4	7	1	J6SF
	.083”x1.000”	5	4	5	1	
	.020”x1.125”	6	9	5	1	

4.2

MATERIAL	SIZE inches	HEAT	OPEN SPACE	GROOVE	PULLBAR TENSION	ANVILE	ANVIL TENSION	MODEL
Aluminum								J5ADU
	.033x.984"	5	3		1 ½	2	1	
	.025x.750"	8	4		2	2	1	
	.025x.185"	8	7	Rear	1	2	1	
Steel	.017x1.2000"	9	7		2	2	2	J6ADU
	.032x1.000"	9	8		2	2	1 ¾	
Copper	.020x 1.125"	6	5		2	2	1	
	.062x.250"	4	6		2	2	1	

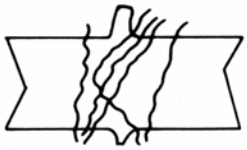
4.3

SIZE inches	STOCK	MATERIAL	HEAT	SPACE	GROOVE	TENSION
.1875	Strand	Steel	7	3/16	Middle	#1
.110	Strand	Steel	8	3/16	Front	#1
.123	Strand	Steel	8	3/16	Front	#1

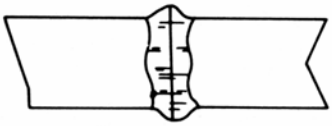
4.4

A GOOD WELD WITH
A CORRECT BURR AND
EVEN HEAT PENETRATION.

EXAMPLES OF GOOD WELDS



A GOOD WELD WILL BREAK
ACROSS WELD ON A BEND TEST

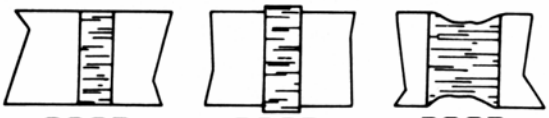


A POOR WELD WITH IMPROPER
UPSET AND A MINIMUM
AMOUNT OF HEAT PENETRATION.

EXAMPLES OF POOR WELDS

A POOR WELD WITH
LITTLE FUSION
AND NO UPSET BURR.

BURR REMOVAL EXAMPLES



GOOD POOR POOR

Weld burr must be removed as close to parent metal as possible. Incomplete burr removal or excessive grinding will cause tension breaks on subsequent wire drawing operations.

Bend test: The weld burr should be the diameter of the rod above vise jaws and bent back forth until rod breaks. A good weld will break across or on either side of the weld.

RECOMMENDED SHEAR CUTS

PLACE IN DIE GROOVES AS
ILLUSTRATED:
CROSSING CUT ENDS.

Note: A - A1 designation indicates position of fraying surfaces for optimum: weld alignment, weld heat and upset pressure utilization.

FIGURE 1

RECOMMENDED SHEAR CUT FOR FLAT STOCK

FIGURE 2

5.0 TYPICAL OPERATING SEQUENCE

J5, J6, J7, J8, J9, C, S & A

Remember: Material to be joined must be free of rust, corrosion, or other insulating material where it contacts welding dies

1. Cut wire ends to best joint configuration. See figure 1.
2. Set open space for proper die opening.
3. Select proper weld heat and range.
4. Place wire into welding dies so the ends touch midway between the welding dies.
5. Push foot treadle down far enough to hold material in place in dies.
6. Close flashguard
7. Push foot treadle down to bottom of stroke to finish clamp process and start weld process
8. Heat is imparted to wire ends through faying surfaces.
9. Movable platen, under upset pressures, moves toward a closed position due to loss of compression yield strength of wire.
10. A weld limit switch, terminates electrical power flow through wire.
11. Actual weld is formed after electric power flow stops, and material is hot forged together with remaining upset pressure.
12. Welded material quickly cools under pressure.
13. Remove stock from dies by releasing foot treadle.
14. Anneal weld zone and sections on either side if applicable.
15. Remove upset burr so the enlarged weld area is equal in diameter to the parent metal size.

5.1 J5SF AND J6SF

1. Cut material ends to best joint configuration. See Figure 2.
2. Set open space for proper die opening.
3. Set flashing speed
4. Select proper weld heat.
5. Place material into weld dies so the ends touch midway between the welding dies; also, flat stock should be against the rear stops in the dies.
6. Push foot treadle down far enough to hold material in place in dies.
7. Close flashguard.
8. Push foot treadle down to bottom of stroke to finish the clamping process, and start weld process.
9. Heat is imparted to the material end through faying surfaces.
10. High current flow causes flashing

11. Movable platen, under controlled speed and pressure, moves toward a closed position, due to flashing, until the faying surfaces are covered with molten metal, and a short length of each part reaches forging temperature.
12. When the movable platen reaches a preset point, flashing speed is terminated, and upset pressure is applied.
13. Further movable platen travel then activates the weld limit switch, and electrical power flow through the material is terminated.
14. Actual weld is formed after electric power flow stops, and material is hot forged together with remaining upset pressure.
15. Welded material quickly cools under pressure.
16. Remove stock from dies by releasing foot treadle.
17. Anneal weld zone and sections on either side, if applicable.
18. Remove upset burr so as the enlarged weld area is equal to the parent metal size.

5.2 J5ADU & J6ADU

1. Cut material ends to best joint configuration. See figure 1.
2. Set open space for proper die opening.
3. Set movable cog on lever arm to proper adjustment.
4. Set leverage arm tension to proper adjustment.
5. Select proper weld heat.
6. Place material into weld dies so as the ends touch mid-way between the welding dies, also flat stock should be against the rear stops in the dies.
7. Push the foot treadle down to the bottom of the stroke to clamp the material.
8. Close flashguard to start the welding process.
9. Heat is imparted to the material ends through faying surfaces.
10. High current flow causes flashing.
11. Movable platen, under controlled speed and pressure, moves toward a closed position, due to flashing, until the faying surfaces are covered with molten metal, and a short length of each part reaches forging temperature.
12. A weld limit switch terminates electrical poser flow through the material.
13. Actual weld or coalescence starts to be formed after electric power flow stops, and clamp arm upset pressure is applied.
14. Further movable platen travel then allows wedging action of the cogs, creating the high pressure upset.
15. Welded material quickly cools under pressure.
16. Remove stock from dies by releasing foot treadle.
17. Anneal weld zone and sections on either side, if applicable.
18. Remove upset burr so as the enlarged weld area is equal to the parent metal size.

5.3 ELECTRO CUT

1. The headpiece space should be set at 3/16".
2. Place stock into the correct die groove.
3. Press, with your foot, the operating treadle until it reaches the bottom position.
4. Lower flashguard. This will make the current flow to the transformer and burn the cable into.
5. Raise flashguard, lift foot treadle to release cable.

Note: If burn-off has excess molten metal around the end, this can be reduced by closing the space between the dies. (Refer to 7.7) Some cables have filler cord with an asphalt impregnation. The asphalt will melt and run into the jaw grooves. Jaw grooves must be kept clean, also the connection between the die and die seat so that good electrical connection is maintained.

5.4 ANNEALING INFORMATION

An anneal operation will be required on hard drawn or carbon steel wire and rod. Annealing will accomplish two things: (1) normalize the grain structure in the weld zone, (2) will soften sections on either side of the immediate weld area.

To anneal, follow directions of one of the following methods, which is applicable to your welder.

5.5 STANDARD TYPE ANNEAL DEVICE

With standard type anneal device cam anneal clamps attached directly to movable and stationary welding platens with "L" shaped brackets or similar devices. Used on welders suitable for welding non-ferrous and low carbon steel wire and rod.

A. Close safety flashguard if equipped with interlocking switch.
B. Place welded stock into anneal clamps with upset burr midway between anneal clamps, clamp securely into position.
C. Push annealing switch with a jogging action to heat material to desired temperature.
D. After the material has lost its color, carefully remove the wire from the anneal jaws and remove the upset burr. Be extremely careful not to get burned on the hot metal.

5.6 FRONT OR DIAL INDICATING ANNEAL DEVICES

A cam type clamp anneal located beneath the welding dies. One clamp is stationary and the other is movable clamp which is attached to a unique mechanism which allows the hot, expanding and annealing wire to remain straight without the normal bowing or bending. This feature assists in preventing fractures in weld zone during anneal process. Both type of devices, front or dial type, are suitable for low carbon steel, mild steel, stainless steel and high carbon steel.

5.7 FRONT TYPE ANNEAL, OPERATING PROCEDURES

A. Close safety flashguard, if so equipped.
B. Place welded stock into anneal clamps with upset burr midway between anneal jaws, being careful to push movable clamp jaw against its inward stop. Carefully tighten wire into both jaws.
C. Push anneal switch in a jogging fashion, to evenly heat up weld area to the desired anneal temperature.
D. Let annealed are cool.
E. After the wire has lost its color, carefully remove the wire from the anneal jaws and remove the upset burr.
F. Be careful not to get burned on the hot metal.

5.8 DIAL INDICATING ANNEAL DEVICE OPERATING PROCEDURES

A. Proceed as instructed on front type anneal and proceed with the following information.
B. When heat is applied to the wire, the heated wire will expand.
C. The dial indicator will start to move as the wire begins to heat up.
D. When the exact anneal temperature is reached, the rotating needle on the dial-indicating device will momentarily stop.
E. In sequence, the needle will drop back slightly, and then start to move forward again.
F. At the start of the second forward movement of the needle, release the anneal switch.
G. Heating the wire beyond this pint, will cause an improperly treated anneal zone.
H. Allow wire to cool down below 1000 degrees F., before removing wire from the anneal clamps. (Loss of coloring to wire)
I. Be extremely careful of hot metal during handling procedures.

5.9 DETERMINING CORRECT ANNEAL TEMPERATURES

The critical temperature of carbon steel wire is also the maximum heating temperature for the annealing process associated with the butt-welding procedures. The critical temperature will vary slightly, but in direct proportion to the wire's carbon content. Since carbon steel is ferromagnetic, the exact annealing temperature can be easily determined by the loss of magnetic qualities at that point.

To expand this process further, a wire that is gradually heated to a point of just beginning to show some color is very close to the correct anneal temperature (about 1000 degrees F). At this point, the jogging off-on of the anneal switch is important, so that when we test the annealing area with a magnet during the off period it will not be drawn to the wire surface due to electrical magnetic flux. When the magnet does not attach to the wire surface, the correct anneal temperature has been achieved. We are looking for the exact point of loss of magnetic qualities, so do not over heat the material beyond this point.

Annealing after welding to enable an operator to draw carbon steel wire is very important for the wire mill and certain techniques have been developed by others which may assist in drawing high carbon steel wire. Possibly the methods described here will be beneficial to your operation.

5.10 ANNEALING ALUMINUM WIRE AND ROD

Annealing aluminum rod and wire can be somewhat difficult since it passes very quickly through the plastic range and blows apart. Be extremely careful not to get burned from expelled aluminum by poor safety techniques.

A good anneal temperature for aluminum rod and wire is approximately 700 degrees F. Common blue carpenters chalk rubbed on the surface to be annealed will assist in obtaining this temperature. The chalk will turn a straw color at the anneal temperature 700 degrees F.

6.0 SPECIAL ADJUSTMENTS

HEADPIECES

Refer to Figure 4

6.1 SPACE ADJUSTING KNOB (A)

Determines the amount of open space between the welding dies.

Calibration:

1. Turn space-adjusting knob to the stop or the number 1 setting.
2. Lay a straight edge across the die seats.
3. The die seats should be level and the weld dies should have the distance from table #1 between the closest die edges.
4. If die seats are not level:
   A. Back headpiece close stop screw off of nylon stop pad.
   B. Loosen the setscrew on the space-adjusting knob.
   C. With a pair of pliers, turn the space-adjusting shaft until dies are level and proper clearance between dies exists.
   D. Retighten spacing knob so that the arrow pointer is across from #1.
5. A compression spring and stop pin are located beneath the spacing knob to assure repeatable positions and overthrow protection. Check to make sure spacing knob has pressure applied to it from this spring and pin is not bent or missing hence preventing proper adjustment, replace as required.

6.2 HEADPIECE CLOSED ADJUSTMENT (B)

Prevents welding dies from touching, and prevents possible over travel of movable platen.

Calibration:

1.Turn space-adjusting knob to the stop at the number 1 setting.

2.Adjust closed stop adjusting screw so that when the movable head is pushed by hand, to a closed position, the weld dies will not touch, and there is approximately .062” at #1 setting.

3.Tighten locknut.

6.3 HEADPIECE OPEN ADJUSTMENT (C)

Adjusts maximum open position of headpiece.

Adjustments:

1. Loosen locknut.
2. Rotate open space adjusting knob to the #9 setting.
3. Adjust the headpiece open stop screw to where it just contacts the casting of the stationary headpiece.
4. Tighten locknut.

6.4 WELD LIMIT SWITCH (D)

Determines the timing point of the weld cycle.
Adjustments:

1. The limit switch is adjusted for actuation by a hex-head bolt, which contacts the limit switch plunger. The weld dies will be used as a reference point to obtain the adjustment.
2. Loosen the limit switch adjusting screw locknut.
3. Set open space adjusting knob to approximate #4.
4. Slowly turn space-adjusting knob clockwise toward #1 until the hex-head bolt activates the limit switch.
5. There should be the distance shown in table #2 between the closest die edges.
6. If the gap is greater than the amount specified in table #2 then screw the bolt in to actuate the limit switch later. If the gap is less,screw the bolt out to actuate the switch sooner.
7. Tighten the limit switch adjusting screw locknut.
8. The limit switch setting remains the same for all sizes of material within the welders rating, but can be used for a verier control of heat in extreme cases to add or subtract slight amounts of heat to assure levelness of welded material.

6.5 CLAMP SPRINGS AND UPSET PRESSURES

Upset Pressure. Refer to Figure 6.
Determines the amount of clamp and upset pressure available for the weld process by making pull bar longer or shorter.
Calibration:

1. A. J5&J6: With nothing in the welding dies, depress the foot treadle.
   B. J7, J8 & J9 Place separate ¼" diameter drill rod pieces into each welding die prior too depressing the foot treadle. Do not allow the rod end to touch between the dies. The rod pieces are simply used to shim the welding die shoes from the welding dies to obtain the proper upset adjustments.
2. With a straight edge, determine that bolts A, B, C and D are all in alignment. Lengthen or shorten the pull bar to attain this setting. This alignment sets the welder for maximum upset pressure.
3. Should you require lesser pressure for smaller stock sizes, the pull bar can be lengthened to decrease upset pressures as per the following.
   A. Pull bar with five holes at lower end, for five different upset pressures. The top hole is maximum upset pressure.

1. Remove the nut and bolt at the lower end of the pull bar.
2. Move pull bar to the desired setting.
3. Replace the bolt and nut.

B. Pull bar with turnbuckle. Read upset pressure by number just above top of turnbuckle. Number one is maximum upset pressure.
1. Loosen locknut at bottom of turnbuckle (turn C.W.)
2. Adjust turnbuckle to desired setting (c.c.w. lengthens)
3. Tighten locknut.

4. Lesser pressures are indicated when center bolts "B" and "C" are above the centerline.
5. Do not shorten the pull bar to such a position so that the center bolts "B" and "C" are below the centerline. Clamp spring breakage could occur!
6. Pressures should not be increased or decreased by cross bolt adjustments.

6.6 CLAMP SPRING CROSS BOLT

Refer to Figure 5

Assures maximum die shoe opening and non-shorting of weld head when annealing.

Calibration:

1. Adjust cross bolt on clap arm on the stationary head to where the clamp arm just contacts the weld die seat and approximately 1/8 to 3/16" clearance is evident between the clamp spring clevis and weld die seat.
2. Adjust cross bolt on clamp arm on the movable head to where the clamp arm just contacts the weld die seat. Tighten lock nuts.

6.6 ELECTRO-CUT

As received, the electro-cut unit will be properly adjusted for space and spring tension for the entire stock range.

The headpiece is actually locked into a stationary position. This is achieved by depressing the foot pedal to the bottom position and hold, then turn the closed head adjusting screw until 3/16" is measured between the weld dies. The open space bolt is then adjusted until the headpiece is locked into a stationary position.

TABLE #1	
Model	**Distance between closest die edges @open space #1**
J5CA, C & S	.188" / 4.76mm
J6S	.313" / 7.94mm
J7 A & C	.313" / 7.94mm
J8C & S	.250" / 6.35mm
J9C	.250" / 6.35mm
TABLE #2	
	Distance between closed die edges

Model	@weld cut-off
J5CA, C & S	.219” / 5.56mm
J6S	.344” / 8.73mm
J7 A & C	.344” / 8.73mm
J8C, S & J9C	.313” / 7.94mm

Important! Do not turn or remove the front center pivot screw and nut. To remove the movable half of the weld head, as specified in the preventive maintenance techniques, loosen and remove the rear center pivot only.

6.7 **ADU COGS & SPRING BAR**

Controls the flashing speed and upset pressure.
Calibration & Adjustments

1.Set head close stop screw to stop movable head when dies are 1/32” between closest die edges (figure 8C)

2. Set open space stop so dies cannot open more than 1/8” between closest die edges.

3. Set movable cog so its point is somewhat to the left of the lower cogs point when the welding dies are set for the desired starting space. (figure 8A)

4. Set the weld limit switch to actuate when the welding dies are 1/16” between closest die edges. Cogs should still have a slight amount of opposing surface to overcome. (figure 8B)

5. To set spring bar, spring bar tension should be backed off completely, than increased in small increments until desired welds are obtained. (figure 8D)

FIGURE 4

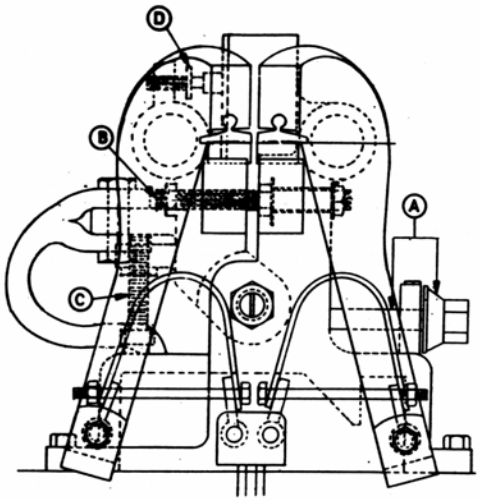
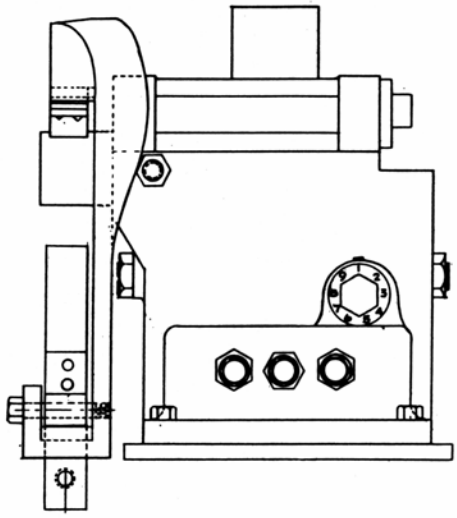


FIGURE 5



A. SPACE ADJUSTING KNOB
B. HEADPIECE CLOSED ADJUSTMENT
C. HEADPIECE OPEN ADJUSTMENT
D. WELD LIMIT SWITCH

6

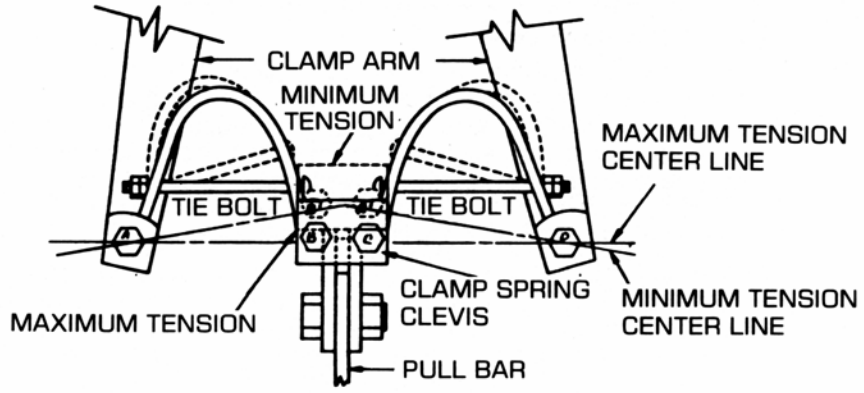


FIGURE 6

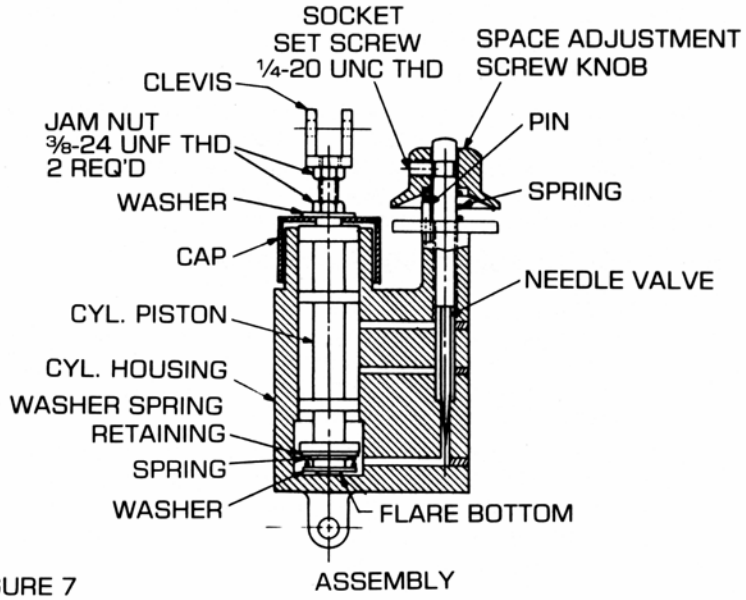


FIGURE 7

NOTE A: CLEVIS MUST BE INSULATED ELECTRICALLY FROM SCREW IN PISTON AND FROM ARM EXTENDING FROM MOVABLE HEADPIECE OF WELDER.

NOTE B: CAP KEYED TO PISTON LOOSEN LOCK NUT AND ROTATE CAP CLOCKWISE TO MAKE UNRESTRICTED MOVEMENT OF PISTON TO BEGIN WHEN WELDING DIES ARE CLOSER TOGETHER.

NOTE C: FLASHING SPEED ADJUSTMENT KNOB. NO. 1 ON KNOB IS SLOWEST FLASHING SPEED. TURN KNOB COUNTER CLOCKWISE TO INCREASE FLASHING SPEED.

NOTE D: BUTTERFLY VALVE CLOSES IN DOWNWARD MOVEMENT - OPENS FOR FREE RETURN OF PISTON.

NOTE E: STEP-OFF ALLOWS HYDRAULIC OIL TO BYPASS PISTON GIVING UNRESTRICTED MOVEMENT.

NOTE F: OIL USED SHOULD BE SINCLAIR DURO-150 OR EQUIVALENT.

8

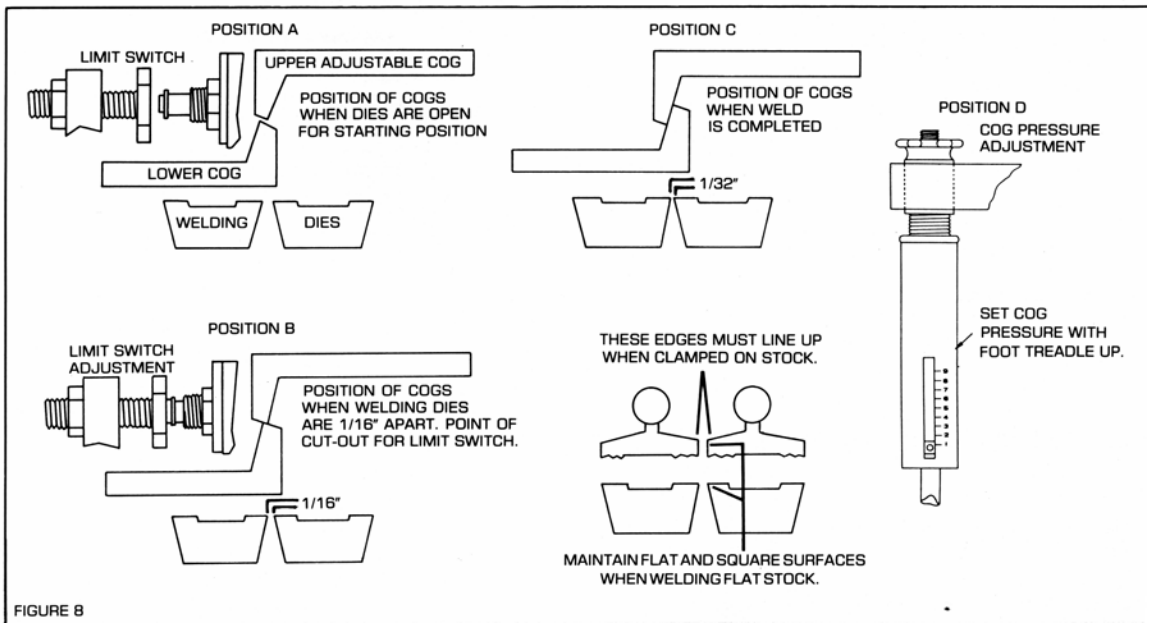


FIGURE 8

7.0 PREVENTATIVE MAINTENANCE

Keep in mind that these welders are precision built to last many years, but will require good maintenance procedures. They are designed to be as automatic as possible with a minimum dependence on the ability of the operator. Adjustments must be made by those thoroughly familiar with the operating principles of the welders.

7.1 AS REQUIRED

1. Remove flashings and loose particles from welding headpieces to prevent accumulation. Use a soft brush and a soft metal scraper.
2. Check condition of welding dies and welding die shoes, replace as required.
3. Check condition of clamp spring assemblies and replace all broken springs, springs that have taken a set as well as worn fiber bushings and washers.

7.2 QUARTERLY

1. Repeat above items.
2. Check anneal dies and replace all worn parts.
3. Check for worn bearings and elongated holes on foot treadle assemble and pull rod parts.
4. General lubrication of all moving parts.

7.3 ANNUALLY

1. Repeat above noted items.
2. Check for worn or poorly aligned contacts within magnetic contactor. (Some older Model J3 and J4 series units do not have contactors.)
3. Clean weld transformer secondary strap connects to movable headpiece. Emery cloth works well to bring all surfaces in this area to a bright and shiny condition. Retighten completely.
4. Check for excessive wear in clamp arm assemblies, where die shoes fit into clamp arm openings. Replace as required.
5. Remove movable welding headpiece by loosening rear pivot centers. Check the condition of the pivot center surfaces, polish and thoroughly clean. Re-lubricate and re-install movable headpiece and adjust so that the movable headpiece do not have any side play. Headpiece must be free to pivot and die seat surfaces must be in good alignment.
6. Check headpiece castings, if worn, replace. Should the welders be used in a corrosive atmosphere, clean off oxides and repaint as required.

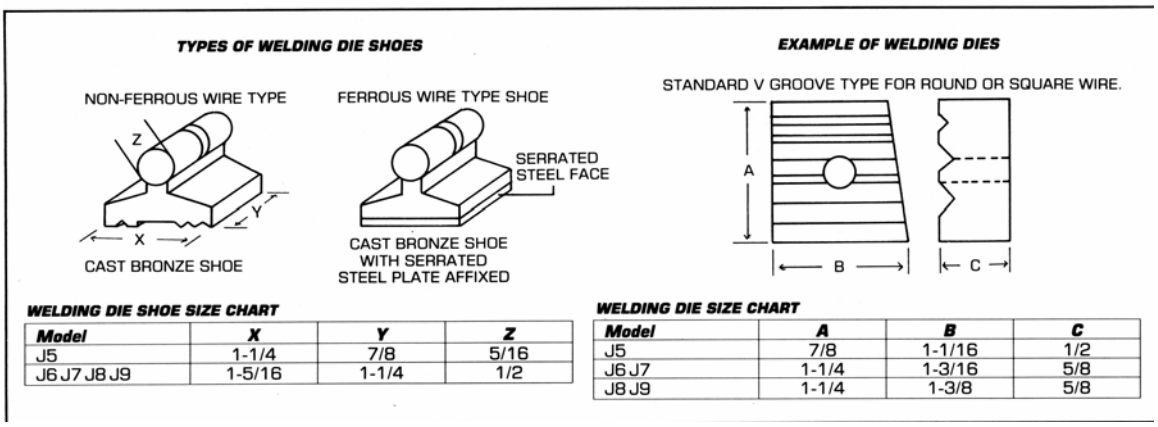
8.0 WELDING DIES AND DIE SHOES INFORMATION

Description:
Welding dies – Lower conducting electrode and clamp jaw
Weld die shoes – Upper clamping member

Welding dies and die shoes in poor condition are the main causes of bad welds.

Care of die sets:
1. Use a brass or fiber blade to remove particles of flashings that build-up on die sets. Excessive flash build-up causes die burns on material and shorting of die sets.
2. Do not attempt to clamp material that is not suited for welder into die sets. Undersized materials will slip and burn die grooves. Oversized materials will overstress clamping parts.
3. Do not use welding die sets for a vise. These parts will not withstand the mechanical abuse.
4. Whenever welding dies are replaced, clean bottoms of dies and corresponding die seats to a bright and clean condition before bolting them tightly into place and oxidize surface will insulate the welding dies and reduce effective welding voltage.

5. Welding die shoes must swivel freely within the clamp arm pivots to prevent cracking of die shoes. File down die shoe boss if necessary.
6. Welding die set will wear with use and must be changed occasionally for good welding results. Keep an adequate supply of replacement parts available. Wire and rod slippage is a problem caused by poor die sets and a major cause of wire breaks.



WELDING DIE SHOE SIZE CHART

Model	X	Y	Z
J5	1-1/4	7/8	5/16
J6 J7 J8 J9	1-5/16	1-1/4	1/2

WELDING DIE SIZE CHART

Model	A	B	C
J5	7/8	1-1/16	1/2
J6 J7	1-1/4	1-3/16	5/8
J8 J9	1-1/4	1-3/8	5/8

9.0 DIAGNOSTIC CHART FOR TROUBLE-SHOOTING

WELDING ACTION	CAUSE	REMEDY
Weld action normal but weld burr doesn't extend beyond wire	Lack of open space	Increase open space until desired burr is obtained
Molten metal is blown out and ends not joined	Weld heat too high Weld limit switch Stock is too small Weak clamp spring	Lower heat settings Set limit switch properly Check size rating of welder Replace clamp springs
Weld area heats up but weld is not complete	Low heat Secondary transformer connections Loose or dirty welding dies Starting space adjust	Increase weld heat Clean and tighten transformer connections Clean welding dies and surfaces Decrease starting space
Weld has complete burr but is dry and breaks off below surface of wire	Upset pressure too great Limit switch settings High carbon steel wire	Lower upset pressure Reset limit switch to specifications Carbon-steel wire often appears like this, process wire by annealing weld before removing burr
Welds good but poorly aligned	Welding dies & die shoes Starting space Loose pivot centers	Replace worn dies and shoes Decrease starting space Return heads to factory
Ends of wire buckle and may not weld	Upset pressure too great Low weld heat	Decrease upset pressure Increase weld heat
Varying weld results Varying weld results	Stock slipping Varying weld voltages Rod condition variations Dies and die shoes Flashings Rod cuts Weld contactor	Worn dies and shoes Check electric lines Clean and tighten transformer connections Clean rod where clamped in dies Replace dies and shoes Clean build-up of flash materials Check contactor for poor contacts

9.1 ELECTRICAL TROUBLE-SHOOTING OF WELDER

(Caution!! Extreme care should be exercised when making these tests. Dangerous voltages are present in the welder. Only persons familiar with electrical safety precautions should perform these tests.)

9.1.1 TROUBLE-SHOOTING TABLE (see section 9.1.3)

This electrical trouble-shooting table is furnished as a suggested method of trouble-shooting the welder. The individual steps of the table should be performed in the order given, to make the test valid. The electrical schematic (section 10) furnished for these tests shows the table test points. This table may be used for welders with a different but closely related wiring by using corresponding test points. During all tests, line voltage should be connected to L1 & L2 of the welder. The heat switch should be set to the #1 position.

9.1.2 FINAL ELECTRICAL CHECKS

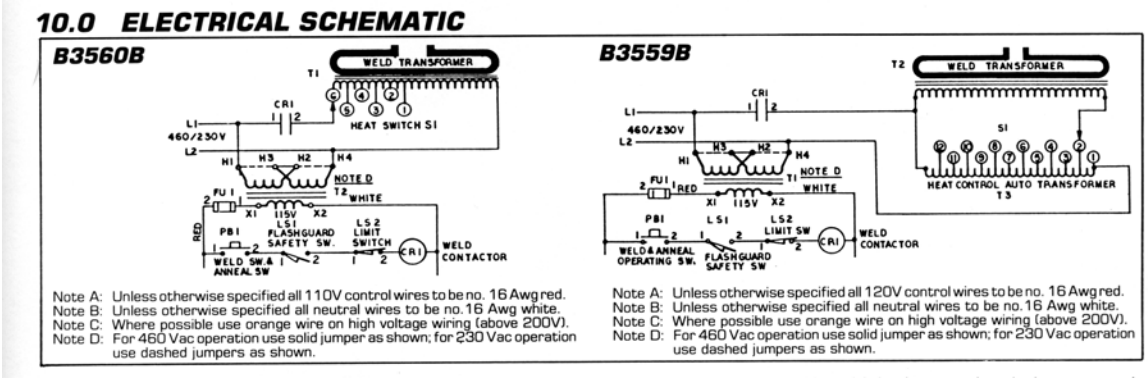
Set the heat switch to the number 1 position, connect the voltmeter across the welding dies. Press the operating switch. The meter reading will typically be less than 10 VAC. Consult the weld specification sheet for this value. Rotate the heat switch through all settings. If the voltage is not read at any setting, the heat switch may be defective. Actuate the weld limit switch; observe the reading goes to zero. Release the weld limit and operating switches, the reading should remain at zero.

9.1.3

TEST LEAD CONNECTION	METER READING	PROBLEM IF NO READING	PRESS OPERATING SWITCH	WELD LIMIT SWITCH ACTUATED	PRESS ANNEAL SWITCH
X1 X2	115 VAC	Bad control transformer(T1)			
X2 FU1-1	115 VAC	Bad fuse connection			
X2 FU1-2	115 VAC	Open fuse			
X2 PB1-1	115 VAC	Open wire to operating switch			
X2 PB1-2	115 VAC	Bad operating switch	X		
X2 LS1-1	115 VAC	Open wire to flashguard switch	X		
X2 LS1-2	115 VAC	Open flashguard switch	X		
X2 LS2-1	115 VAC	Open wire to weld limit switch	X		
X2 LS2-2	115 VAC	Bad weld limit switch	X		
L2 CR1-1	Line voltage	Open wiring to contactor			
L2 CR1-2	Line voltage	Bad contactor	X		
L2* S1-1	Line voltage	Open wire to heat switch	X		

* For welders using autotransformer. This terminal is L1.
Note: To perform repairs consult section 13 for parts identification.

10.0 ELECTRICAL SCHEMATIC



11.0 SAFETY REMINDERS

The following accident prevention information is presented to eliminate potential hazards while operating, inspecting or repairing Micro-Weld electric resistance welding equipment.

Important safety compliance information for Micro-Weld Welders.

GENERAL

1. Prior to using equipment, an operator must be instructed on basic operation and malfunction methods, by qualified personnel.
2. Safety eyeglasses must be worn by all personnel operating or servicing welders.
3. Use safety equipment properly and keep safety equipment on welders.
4. Determine that both operating voltages and hertz (cycles) of power supply correspond to ratings listed on weld nameplate located on weld housing.
5. Check nameplate ratings and keep within capacities and material categories stated therein.
6. Adjustment or repairs must be made by persons thoroughly familiar with operating principles of welder.
7. Welder must be disconnected from power supply prior to maintenance or repair procedures.
8. Reduce air supply pressures or disconnect from air source, for pneumatically equipped welders, prior to maintenance or repair procedures.
9. Welders equipped with water cooling accessories must have water supply turned off during idle periods and allow only enough water to flow to cool heated components during weld operation.

ELECTRICAL

1. Refer to National Electrical Code and local regulations for adequate electrical wiring to power welder. Do not operate welder with inadequate electrical power supply cords or cable.
2. All welders must be ground through power supply and welder ground connection terminal securely tightened.
3. All welders must be able to be disconnected from power source either by a double breaking disconnect switch or unplugged by standard rated plugs.
4. All welders must be fused to prevent injury should an electrical malfunction occur. Welders must never be fused for an ampere load that exceeds the ratings stated on weld nameplate. Normally welders are fused using the nameplate rated load; time lag parameters functional of standard fuses allow this specification.

5. Electric power cords to welder must be kept in good condition. Report any damage or potential hazards to maintenance personnel.

6. The weld heat selection switch, potentiometer or range selection devices must not be changed to a new position while a weld operating is in process.

12.0 BUYERS GUIDE

HOW TO ORDER PARTS:

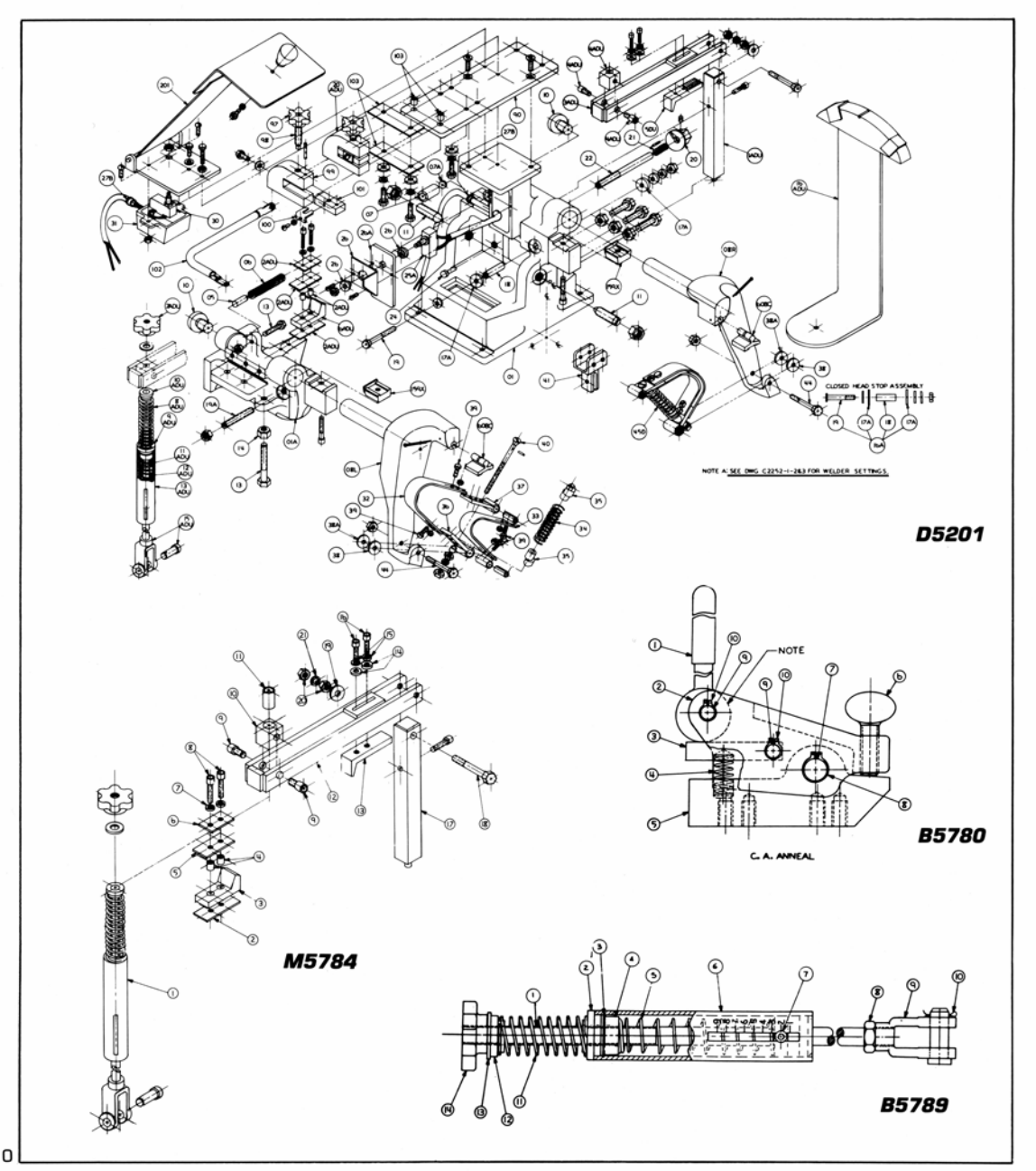
You must provide

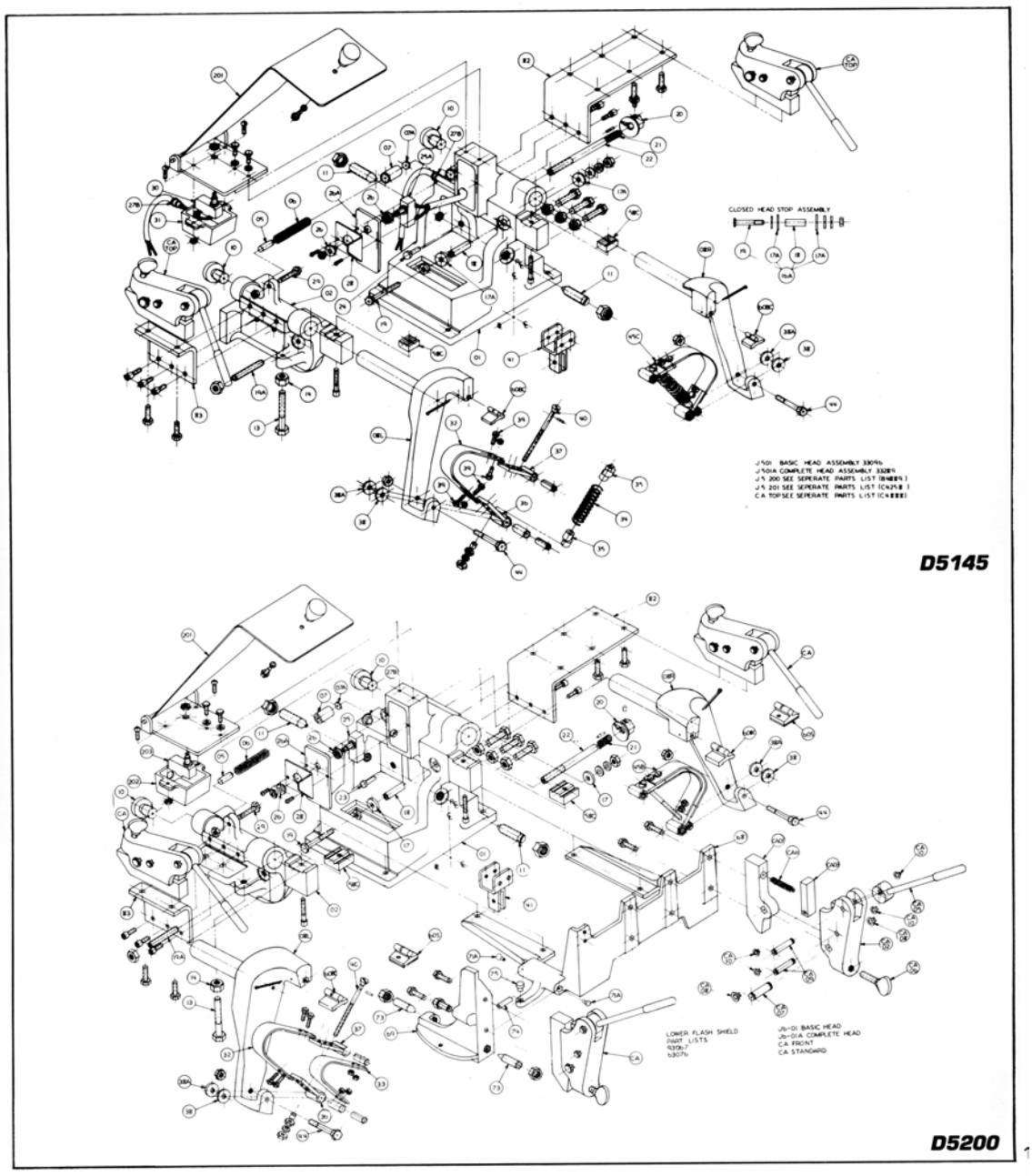
1. Machine Model
2. Machine Serial Number
3. Voltage

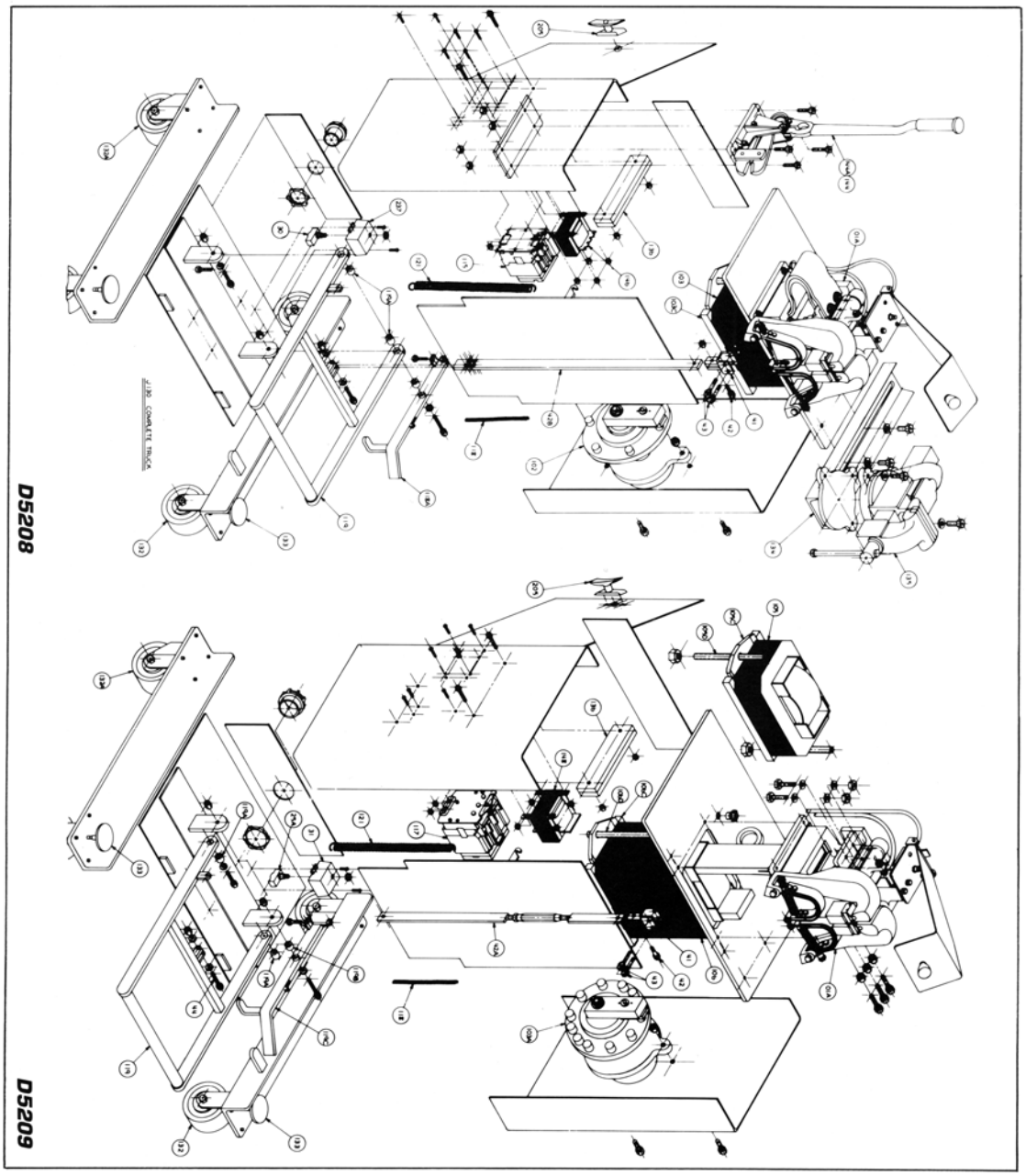
Then identify part(s) on part list (last page in book) and provide MICRO with the circled number

CALL MICRO at 800-872-1068

Provide MICRO with your company name, address and purchase order number.


CLOSED HEAD STOP ASSEMBLY
NOTE A: SEE DWG. C2252-1-283 FOR WELDER SETTINGS.
D5201
NOTE
C. A. ANNEAL
B5780
M5784
B5789


CLOSED HEAD STOP ASSEMBLY
J-501 BASIC HEAD ASSEMBLY 33094
J-501A COMPLETE HEAD ASSEMBLY 33089
J-% 200 SEE SEPERATE PARTS LIST (B4889)
J-% 201 SEE SEPERATE PARTS LIST (C4258)
C.A TOPSEE SEPERATE PARTS LIST (C4888)
D5145
LOWER FLASH SHIELD
PART LISTS
93067
93071
J%-01 BASIC HEAD
J%-01A COMPLETE HEAD
C.A FRONT
C.A STANDARD
D5200



2

ADDENDEM Updated Cylinder Replacement Directions

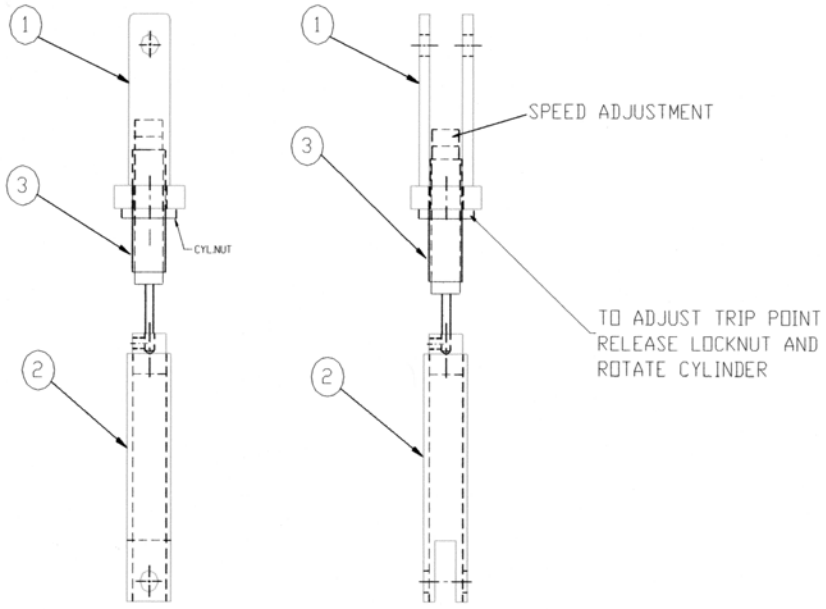
Remove the current cylinder along with the arm insulator bushing. Remove both right side head bolts that fasten the head to the truck. Place the cylinder plate direct on top of the head lining up the boltholes. Using the bolts provided, bolt down the plate to the head making sure that the bolt insulators are still intact on the plate.

While compressing the cylinder down, attach the arm pivot to the head arm. The speed of the cylinder retraction has been preset at the factory. However, adjustments may be needed to establish the correct upset cutoff. Loosening the cylinder nut and then turning the cylinder itself up or down will alter the location of the weld upset. See welder manual for correct machine setup.

ITEM	QTY.	PART NO.	DESCRIPTION
1	1	62212	UPPER BRACKET
2	1	62211	LOWER BRACKET
3	1	62214	CYLINDER-MAKE FROM 25586
4	1		1/4-20 SETSCREW - 1/4 LG.

FIGURE 12

ITEM NO. 62210



"J" MODEL HYDRAULIC CYLINDER

THIS CYCLINDER CONTROLS THE SPEED AND UPSET POSITION.

Calibration:

1.Set closed stop adjusting screw to stop movable head when dies are 1/32” between closest die edges.

2.To set unrestricted movement of hydraulic cylinder to begin when dies are 3/32” apart;

A. If unrestricted movement starts at a greater distance:
   1.Loosen lock nut on cylinder.
   2.Rotate cylinder counterclockwise to make unrestricted movement of piston to begin when welding dies are closer together.
   3.Tighten locknut.

B. If unrestricted movement starts at a lesser distance:
   1. Loosen lock nut on cylinder
   2. Rotate cylinder clockwise to make unrestricted movement of piston begin when welding dies are further apart.
   3. Tighten lock nut.

3.Set limit switch to cut-off weld current 1/32” a after unrestricted movement has begun.

PARTS LIST J45, J5-8

J45, J5, J6, J7 AND J8

Part No.	Description	Applicable Welders								Item No.
		Ferrous Welders				Non-Ferrous Welders				
		J45S	J5S	J6S	J8S	J45C	J5C	J7C	J8C	
01	Headpiece stationary and movable castings, matched machined w/pivots and center	X	X			X	X			33096
01A	Complete headpiece assembly w/all operating parts state model number	X	X			X	X			33095
01	Headpiece stationary and movable castings, matched machined w/pivots and center			X				X		33100
01A	Complete headpiece assembly w/all operating parts state model number			X				X		33099
01	Headpiece stationary and movable castings, matched machined w/pivots and center				X				X	33203
01A	Complete headpiece assembly w/all operating parts state model number				X				X	33287
05	Headpiece return spring guide	X	X	X	X	X	X	X	X	33017
06	Headpiece return spring	X	X	X	X	X	X	X	X	80036
07	Headpiece return spring insulated bushing	X	X	X	X	X	X	X	X	33018
07A	Return spring plug	X	X	X	X	X	X	X	X	85051
08L	Clamp arm, Std. left	X	X			X	X			33004
O8R	Clamp arm, std. Right	X	X			X	X			33005
08L	Clamp arm, Std. left			X				X	X	33008
08R	Clamp arm, std. Right			X	X			X	X	33009
08L	Clamp arm, Std. left				X					33012
08R	Clamp arm, std. Right									33013
10	Clamp arm retaining screw	X	X	X	X	X	X	X	X	33019
11	Headpiece adjustable center front or rear	X	X	X	X	X	X	X	X	33023
13	Open headpiece stop screw and nut nylon	X	X	X	X	X	X	X	X	93111
14	Open head stop nut	X	X	X	X	X	X	X	X	33020
16	Closed headpiece stop button	X	X	X	X	X	X	X	X	53030
16A	Closed head stop assembly	X	X			X	X			33027
16A	Closed head stop assembly			X	X			X	X	33029
17	Closed headpiece screw insulating washer	X	X	X	X	X	X	X	X	92906
18	Closed headpiece screw insulating tube	X	X			X				33026
18	Closed headpiece screw insulating tube			X	X		X	X	X	33028
19	Closed headpiece stop screw, stationary	X	X	X	X	X	X	X	X	33352

Part No.	Description	Applicable Welders								
		Ferrous Welders				Non-Ferrous Welders				
		J45S	J5S	J6S	J8S	J45C	J5C	J7C	J8C	Item No.
20	Space adjusting screw knob	X	X	X	X	X	X	X	X	32553
21	Space adjusting screw tension spring	X	X	X	X	X	X	X	X	80037
22	Space adjusting screw	X	X	X	X	X	X	X	X	33024
23	Space adjusting screw fiber insert	X	X	X	X	X	X	X	X	
24	Space adjusting screw fiber bumper	X	X	X	X	X	X	X	X	33024
32	Clamp spring outer leaf	X	X	X	X	X	X	X	X	80038
33	Clamp spring inner leaf			X	X			X	X	80039
34	Clamp coil spring					X	X	X	X	80040
34A	Clamp coil spring, heavy duty				X			O	O	80041
35	Clamp coil spring guide				X	X	X	X	X	33030
36	Clamp coil outer lug	X	X	X	X	X	X	X	X	33233
37	Clamp spring inner lug	X	X	X	X	X	X	X	X	33365
38	Clamp spring insulating washer, 1/16”	X	X	X	X	X	X	X	X	92910
38A	Clamp spring insulating washer, 1/8”	X	X	X	X	X	X	X	X	92906
39	Clamp spring, inner and outer leaf, attaching screw and nuts	X	X	X	X	X	X	X	X	90217
40A	Clamp spring cross bolt, washer and nuts, steel	X	X	X	X					33288
40C	Clamp spring cross bolt, washer and nuts, copper					X	X	X	X	33305
41	Clamp spring assembly center clevis	X	X	X	X	X	X	X	X	53007
42	Clamp spring pull bar to center clevis attaching bolt and nut	X	X	X	X	X	X	X	X	90260
42A	Clamp spring pull bar with adjustable turnbuckle	O	O	O	O	X	X	X	X	43002
42B	Clamp spring pull bar without turnbuckle, used on steel type welders only	X	X	X	X					43003
43	Clamp spring assembly to center clevis attaching bolt and nut	X	X	X	X	X	X	X	X	90262
44	Clamp spring assembly to clamp arm attach bolt and nut	X	X	X	X	X	X	X	X	90265
45A	Clamp spring assembly, complete type A	X	X							53008
45B	Clamp spring assembly, complete type B			X						53009
45C	Clamp spring assembly, complete type C					X	X			53010
45D	Clamp spring assembly complete type D							X	X	53011
45E	Clamp spring assembly complete type E				X					53012
25	Limit switch, long stem type			X	X			X	X	59084

Part No.	Description	Applicable Welders								Item No.
		Ferrous Welders				Non-Ferrous Welders				
		J45S	J5S	J6S	J8S	J45C	J5C	J7C	J8C	
25A	Limit switch, short stem type	X	X			X	X			57810
26	Limit Switch insulating washers pr	X	X	X	X	X	X	X	X	92915
26A	Limit switch cover, new style	X	X	X	X	X	X	X	X	53003
27	Limit switch connection cord	X	X	X	X	X	X	X	X	53002
27A	Limit switch connection cord grip	X	X	X	X	X	X	X	X	86164
27B	Limit switch connection cord bushing	X	X	X	X	X	X	X	X	48407
28	Limit switch protection shield, safety	X	X	X	X	X	X	X	X	53004
29	Limit switch adjusting screw and nut	X	X	X	X	X	X	X	X	53005
30	Anneal and operating switch	X	X	X	X	X	X	X	X	57810
31	Anneal and operating switch cover	X	X	X	X	X	X	X	X	32523
115	Welding contactor, 25 ampere type	X	X	X						57609
115A	Replacement coil, 25 amp type	X	X	X						57619
115B	Replacement contacts, kit 15 amp type	X	X	X						57624
116	Welding contactor, 50 ampere type				X	X	X			57610
116A	Replacement coil, 50 amp type				X	X	X			57620
116B	Replacement contacts, kit. 50 amp type				X	X	X			57625
117	Welding contactor, 100 ampere type							X	X	57611
117A	Replacement coil, 100 ampere type							X	X	57622
117B	Replacement contacts, kit, 100 amp type							X	X	57626
103	Welding transformer, complete ferrous welding type, 6 primary leads	X	X	X						
103A	Replacement primary coil only for No 103	X	X	X						
103B	Replacement secondary ribbon for No 103	X	X	X						
103C	Transformer mounting ring for No 103	X	X	X						
103D	Transformer mtg ring stud for No 103 2 req'd	X	X	X						
104	Welding transformer, complete, ferrous welding type, 2 primary leads, used in conjunction with No 106 and 12 point heat selection switch				X					
104A	Replacement primary coil for No 104				X					
104B	Replacement secondary ribbon for No 104				X					

		Applicable Welders								
		Ferrous Welders				Non-Ferrous Welders				
Part No.	Description	J45S	J5S	J6S	J8S	J45C	J5C	J7C	J8C	Item No.
104D	Transformer mtg ring stud for No 104 2 req'd				X					
105	Welding transformer, complete non ferrous welding 2 primary leads, used in conjunction with No 106 and 12 point heat selection switch					X	X	X	X	
105A	Replacement primary coil for 105, std					X	X	X	X	
105X	Replacement primary coil for 105. extra capacity, heavy-duty type, optional					X	X	X	X	
105B	Replacement secondary ribbon for 105					X	X	X	X	
105C	Transformer mounting ring for 105					X	X	X	X	
105D	Transformer mounting ring stud for 105 2 req'd					X	X	X	X	
106	Auto Transformer, for use with 12 point heat selection switch					X	X	X	X	
106A	Replacement secondary ribbon for 106				X	X	X	X	X	
106C	Auto-transformer mounting ring stud for 106				X	X	X	X	X	
106D	Auto-transformer mounting ring stud for 106, 2 required				X	X	X	X	X	
107	Secondary to headpiece retaining strap	X	X							
146	Step down transformer .05KVA for use with 50 ampere switch control circuits	X	X	X						57600
147	Step down transformer 1KVA for use with 50 ampere switch control circuits				X	X	X			57601
148	Step down transformer 1.5KVA for use with 100 ampere switch control circuits							X	X	57602
58C	Welding dies, lower, copper, pair	X	X			X	X			33046
58C	Welding dies, lower, copper, pair			X				X		33049
58C	Welding dies, lower, copper, pair				X				X	33052
58M	Welding dies, lower, alloy-class No 2, pair	X	X			X	X			33047
58M	Welding dies, lower, alloy-class No 2, pair			X				X		33050
58M	Welding dies, lower, alloy-class No 2, pair				X				X	33053
58E	Welding dies, lower, alloy-class No 4, pair	X	X			X	X			33048

Part No.	Description	Applicable Welders								
		Ferrous Welders				Non-Ferrous Welders				
		J45S	J5S	J6S	J8S	J45C	J5C	J7C	J8C	Item No.
58E	Welding dies, lower, alloy-class No 4, pair			X				X		33051
58E	Welding dies, lower, alloy-class No 4, pair				X				X	33054
58EA	Welding die set, 4 pcs, suitable for welding flat stock material	X	X			X	X			33250
58EA	Welding die set, 4 pcs, suitable for welding flat stock material			X				X		33359
58EA	Welding die set, 4 pcs, suitable for welding flat stock material				X				X	33362
58EB	Welding dies set, 4 pcs, suitable for welding strand material state 2 exact material sizes 2-radius grooves	X	X			X	X			33261
58EB	Welding dies set, 4 pcs, suitable for welding strand material state 2 exact material sizes 2-radius grooves			X				X		33355
58EB	Welding dies set, 4 pcs, suitable for welding strand material state 2 exact material sizes 2-radius grooves				X				X	33363
59	Welding die attaching screw	X	X	X	X	X	X	X	X	90624
60S	Welding die shoes, upper, steel faced, pr	X	X			X	X			33056
60S	Welding die shoes, upper, steel faced, pr			X	X			X	X	33062
60SA	Replacement steel faces for 60S each	X	X							33055
				X	X			X	X	33061
60SB	Rivets for steel face insets each	X	X	X	X					93051
60BC	Welding die shoes, upper, hardened bronze pair				X	X	X	X	X	33057
60BC	Welding die shoes, upper, hardened bronze pair			X	X			X	X	33063
68A	Complete front anneal assembly	X	X	X	X					62136
68	Front anneal frame stationary casting	X	X	X	X					62134
69	Front anneal frame movable casting	X	X	X	X					62135
71A	Front anneal, movable casting bearing nylon insert	X	X	X	X					37713
73	Front anneal, movable casting adjustable pivot center	X	X	X	X					62137
74	Front anneal movable casting closed stop	X	X	X	X					33017
75	Front anneal movable casting open stop	X	X	X	X					62138

Part No.	Description	Applicable Welders								Item No.
		Ferrous Welders				Non-Ferrous Welders				
		J45S	J5S	J6S	J8S	J45C	J5C	J7C	J8C	
76	Front anneal movable casting shunt lug	X	X			X	X			62069
76	Front anneal movable casting shunt lug			X	X			X	X	62070
77	Front anneal movable casting shunt cable	X	X			X	X			62076
77	Front anneal movable casting shunt cable			X	X			X	X	62077
78	Front anneal assembly dial indicator	X	X	X	X					77851
81	Front anneal assembly dial indicator	X	X	X	X					62012
82	Standard anneal bracket, stationary head	O	O	O	O	X	X	X	X	62072
83	Standard anneal bracket, movable head	O	O	O	O	X	X	X	X	62073
84	Standard anneal bracket mounting screws, 6 rq'd	O	O	O	O	X	X	X	X	90231
118	Anneal pedal return spring	X	X	X	X	X	X	X	X	80043
119	Foot pedal return spring	X	X	X	X	X	X	X	X	43073
119A	Foot pedal assembly bushings	X	X	X	X	X	X	X	X	43100
120	Foot pedal return spring old style prior to Ser No 6152	X	X	X	X	X	X	X	X	80044
121	Foot pedal return spring, new style after Ser No 6152	X	X	X	X	X	X	X	X	80045
132	Caster complete, stationary type	X	X	X	X	X	X	X	X	48104
132A	Caster complete, swivel type	X	X	X	X	X	X	X	X	48105
132B	Replacement caster wheel only	X	X	X	X	X	X	X	X	48119
133	Caster brake, knob and stud assembly	X	X	X	X	X	X	X	X	43528
134	Filing vise mounting bracket	X	X	X	X	X	X	X	X	60022
135	Filing vise, standard model	X	X	X	X	X	X	X	X	78112
136	Fiber terminal block, power input	X	X	X	X	X	X	X	X	53000
144	Bench shear No 1 type capacity to 3/8" rod	X	X	X		X	X	X		78202
144A	Replacement blade, bench shear No 1 type	X	X	X		X	X	X		78205
145	Hand shear No 4 type capacity to ½" rod				X				X	64009
145A	Replacement blades No 4 shear pair				X				X	78204
225	Air conversion kit complete, state model	X	X	X	X	X	X	X	X	Appl
226	Replacement air cylinder	X	X	X		X	X			77702
226A	Replacement cylinder diaphragm type No 16	X	X	X		X	X			77709

Part No.	Description	Applicable Welders								Item No.
		Ferrous Welders				Non-Ferrous Welders				
		J45S	J5S	J6S	J8S	J45C	J5C	J7C	J8C	
227	Replacement cylinder diaphragm type No 30				X			X	X	77704
227A	Replacement cylinder diaphragm type No 30				X			X	X	77711
227B	Replacement cylinder shaft protection boot type No 30				X			X	X	77717
228	Upset plate and lever mechanism type No 16	X	X	X		X	X			
229	Upset plate and lever mechanism type No 30				X			X	X	43515
230	Lever mechanism return spring	X	X			X	X			80046
230	Lever mechanism return spring			X	X			X	X	80048
231	Lever mechanism bushings 2 req'd	X	X	X	X	X	X	X	X	43091
232	Air regulator and filter assembly	X	X	X	X	X	X	X	X	77800
233	Pressure gauge	X	X	X	X	X	X	X	X	77822
234	3-way foot valve, complete	X	X	X	X	X	X	X	X	77860
235	Flow control valve	X	X	X	X	X	X	X	X	77862
236	Quick exhaust valve	X	X	X	X	X	X	X	X	77857
237	Operating switch housing	X	X	X	X	X	X	X	X	32523
238	Operating switch	X	X	X	X	X	X	X	X	57810
240	Hose clamp	X	X	X	X	X	X	X	X	78107
241	Hose, per foot, state length	X	X	X	X	X	X	X	X	78102
243	Pull bar with adjusting turnbuckle	X	X	X	X	X	X	X	X	43001
200	Flashguard complete with switch, switch housing and cord	X	X	X	X	X	X	X	X	43102
201	Flashguard and mounting bracket only	X	X	X	X	X	X	X	X	43005
202	Flashguard switch housing only	X	X	X	X	X	X	X	X	32523
203	Flashguard switch	X	X	X	X	X	X	X	X	57810
204	Lower flash shield used with standard headpiece mounted anneal only	X	X	X	X	X	X	X	X	43000
205	Key lock rear access door locking handle	X	X	X	X	X	X	X	X	48209
205A	Replacement key only identical	X	X	X	X	X	X	X	X	48210
09L	Clamp arm, LH hand clamp type special						X			33076
09R	Clamp arm, RH hand clamp type special						X			33075
51	Hand clamp, torsion spring	X	X	X	X					80042
52	Hand clamp handle	X	X	X	X					33034
53L	Hand clamp cam, LH	X	X			X	X			33036
53L	Hand clamp cam, LH			X	X			X	X	33037
53R	Hand clamp cam, RH	X	X			X	X			33038
53R	Hand clamp cam, RH			X	X			X	X	33039
54	Hand clamp handle	X	X	X	X					33035
55	Hand clamp clevis bolt	X	X	X	X					33236
56	Hand clamp set screw	X	X	X	X					90015

Part No.	Description	Applicable Welders								
		Ferrous Welders				Non-Ferrous Welders				
		J45S	J5S	J6S	J8S	J45C	J5C	J7C	J8C	Item No.
90	Anneal mounting plate, flat stock type	X	X	X	X	X	X	X	X	62123
97	Anneal knob, flat stock type	X	X	X	X	X	X	X	X	62124
98	Anneal stud, flat stock type	X	X	X	X	X	X	X	X	62125
99	Anneal clamp body, flat stock type	X	X	X	X	X	X	X	X	62126
99A	Anneal clamp body with shunt cable and lug, flat stock type	X	X	X	X	X	X	X	X	62140
100	Anneal shoe clip, flat stock type	X	X	X	X	X	X	X	X	62128
101	Anneal shoe, flat stock type	X	X	X	X	X	X	X	X	
158X	Welding dies and die shoes, flat stock type 4 piece set, state model and serial number Note for flash welders only		X	X						
159X	Welding dies and die shoes, flat stock type 4 piece set, state model and serial number Note for dual upset welders only		X	X						
160X	Welding dies and die shoes, round stock type 4 piece set, radius grooves, state sizes Note for dual upset welders only		X	X						
109L	Clamp arm, special for J5ADU, LH – Note for dual upset welders only		X							
109R	Clamp arm, special for J5ADU, RH – Note for dual upset welders only		X							

O - Optional